

### REMARKS

The foregoing amendments and following arguments are believed responsive to the Office Action mailed on May 11, 2006. Claims 1-49 are pending in this application. Claims 1 –44 were originally in the application. Claims 45-49 were added by a previous amendment. Independent claim 24 has been amended with deemed allowable subject matter and claim 28 has been or rewritten into independent form having deemed allowable subject matter as suggested by the Examiner. Claims 29-33 have been amended to comport with dependency formalities. Claims 25, 27, and 42-44 have been canceled in the present communication. Support for the amendments can be found in the original claims and specification.

Also accompanying this communication is a petition to extend the prosecution on this matter for three months and the appropriate fee. In view of Applicant's amendments and comments discussed hereinafter, allowance of remaining pending claims 1-24, 26, 28-41, and 45-49 is respectfully requested.

### Brief Discussion of the Invention

The present invention comprises a system and method of remotely extracting information from a communications station by interrogation with a low power beam. Nonlinear phase conjugation of the low power beam results in a high power encoded return beam that automatically tracks the input beam and is corrected for atmospheric distortion. Intracavity non-degenerate four wave mixing is used in a broad area semiconductor laser in the communications station to produce the return beam.

Degenerative four wave mixing entails three input waves having the same frequency. In non-generative four wave, such as that taught by Applicant, by injecting a probe beam having a frequency, into two counter-propagating pump beams with a predetermined angle, the phase conjugate signal counter-propagating to the incident probe beam is generated as a result of the pump beam diffraction from the spatial grating of the carrier density caused by the interference between the other pump and probe beams and will be at a frequency not equal to the probe beam frequency. In Applicant's invention, this four wave mixing process occurs "intracavity", i.e., within the claimed broad area device.

Broad area is an important claimed limitation described by Applicant in the specification on page 6, lines 16-18. For example, Applicant states, "'broad area' will be used herein to indicate that the micro-phase conjugators are large aperture phase conjugators in a semiconductor device. An aperture may be defined as the acceptance opening or input of a phase conjugate system.....Broad area also indicates that the micro-phase conjugators are multimode (spatially)." Moreover, on page 11, lines 11-25, Applicant further describes the claimed broad area device by comparing conventional four wave mixing in one dimensional systems with his two-dimensional system. For example, Applicant states, "commercial broad area diodes are designed as thin rectangular gain stripes that are nominally 1000 to 2000 $\mu$ m long with 100 to 300 $\mu$ m wide by 1 to 2 $\mu$ m high emitter apertures." It is important to note that such conventional devices spatially filter an atmospherically aberrated input beam, destroying the spatial information required to produce a spatially phase conjugated retro-beam. Because they

destroy spatial information, such devices do not correct for atmospheric distortions. By contrast, Applicant's claimed device has an aperture defined not by the thin gain strip, but by the broad area defined from the top (i.e., from a top down perspective) of the RM-PCM 310 device as shown in Figure 3B of the application. Accordingly, Applicant's two-dimensional claimed broad area intracavity phase conjugator is capable of resolving a substantial portion of the spatial components of the input waveform of the interrogating beam to enable correction for an atmospherically aberrated beam.

#### Discussion of the Office Action

In the Office Action of 05/11/06, the Examiner rejected claims 24, 26, 27, 29-31, 33, and 42-44 under 35 U.S.C. §103(a) as being unpatentable over Pepper et al. (US 5,038,359 A) in view of Vasil'ev et al ("Phase-conjugation broad area twin-contact semiconductor laser," Applied Physics Letters, July 1997) and she objected to claims 25, 28, and 32 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### Discussion of Rejection of Claims 24, 26, 27, 29-31, 33, and 42-44 under 35 U.S.C. §103(a)

As set forth above, claims 24, 26, 27, 29-31, 33 and 42-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pepper et al. (US 5,038,359 A) in view of Vasil'ev et al ("Phase-conjugation broad area twin-contact semiconductor laser," Applied Physics Letters, July 1997). Applicant respectfully traverses the rejection based on the comments and amendments herein.

Regarding claim 24, the Applicant has amended the material in claim 24 with the deemed allowable material of claim 25 as suggested by the Examiner. In light of the amendment to independent claim 24, the rejection of claim 24 under 35 U.S.C. §103(a) is requested to be removed.

Regarding dependent claim 26, such claim now depends from amended claim 24 having deemed allowable material as suggested by the Examiner. In light of the amendment to the base claim (i.e., claim 24), the rejection of claim 26 under 35 U.S.C. §103(a) is requested to be removed.

Regarding claims 27, and 42-44, such claims have been canceled to comport with the Examiner's suggestions. In light of the cancellation of claims 27, and 42-44, the rejection of such claims under 35 U.S.C. §103(a) is deemed moot.

Regarding claims 29-31, and 33, such claims have been amended to depend from objected to claim 28, which has been rewritten into independent format to comport with the Examiner's suggestions. In particular, claim 28 has been rewritten into independent format to include the limitations of claim 24 as suggested to by the examiner. In light of the amendment to the base claim (i.e., claim 28), and in light of the new dependency of such amended claims, the rejection of claims 29-31, and 33 are also requested to be removed.

#### Allowable Subject Matter

Claims 25, 28, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

Therefore, claim 25, which contains allowable subject matter, has been rewritten into base claim 24 as suggested by the Examiner and claim 25 has been provisionally canceled. Accordingly, the objection to claim 25 is deemed moot.

Claim 28 has been rewritten into independent form including all of the limitations of base claim 24 as suggested by the Examiner. Accordingly, the objection to claim 28 has been overcome.

Objected to claim 32 has been amended to depend from now independent claim 28, which has deemed allowable subject matter and thus has not been rewritten into independent form. Accordingly, the objection to claim 32 has been overcome.

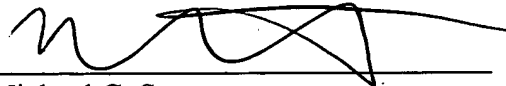
Claims 1-23, 34-41 and 45-49 are allowed.

Reconsideration Requested

The undersigned respectfully submits that, in view of the foregoing amendments and remarks, the rejections and objections of the claims raised in the Office Action dated May 11, 2006 have been fully addressed and overcome, and the present application is believed to be in condition for allowance.

Accordingly, it is respectfully requested that this application be reconsidered, that remaining pending claims 1-24, 26, 28-41, and 45-49 be allowed, and that this case be passed to issue. In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that can be clarified with a telephone conference, she is respectfully requested to initiate the same with the undersigned at (925) 422-3682.

Dated: 11/19/06

  
\_\_\_\_\_  
Michael C. Staggs  
Attorney for Applicants  
Reg. No.: 50,938